

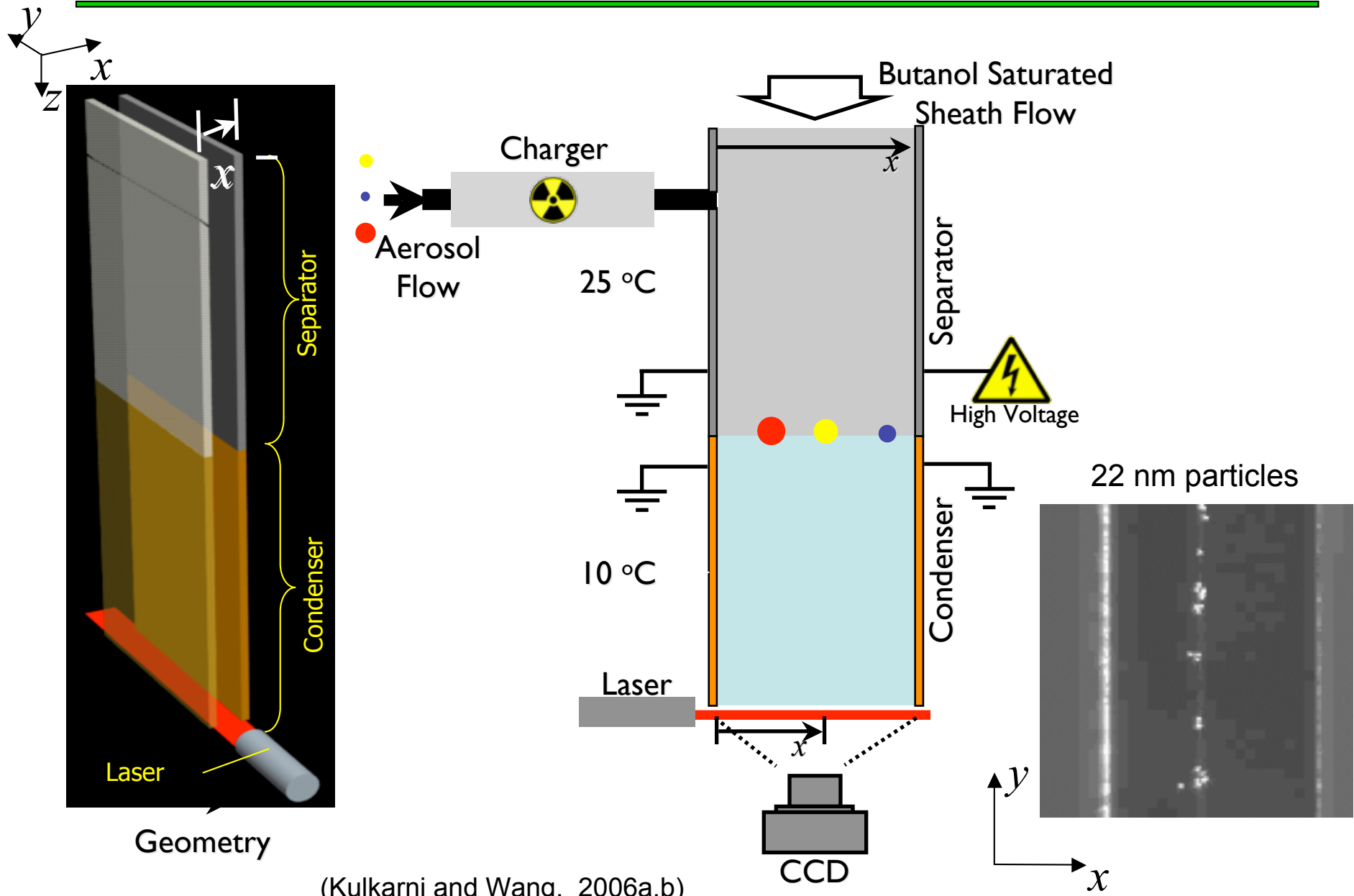
A Fast Integrated Mobility Spectrometer with enhanced dynamic size range

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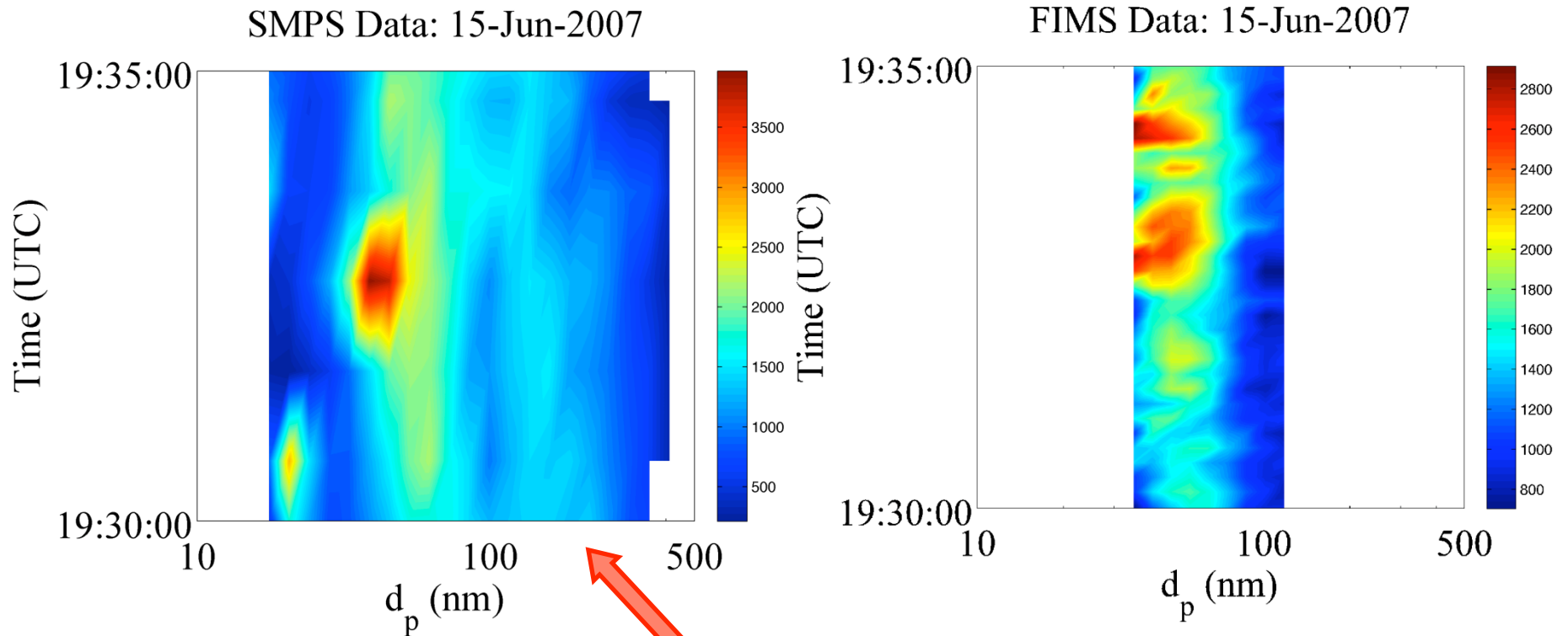


Principle of the Fast Integrated Mobility Spectrometer (FIMS)



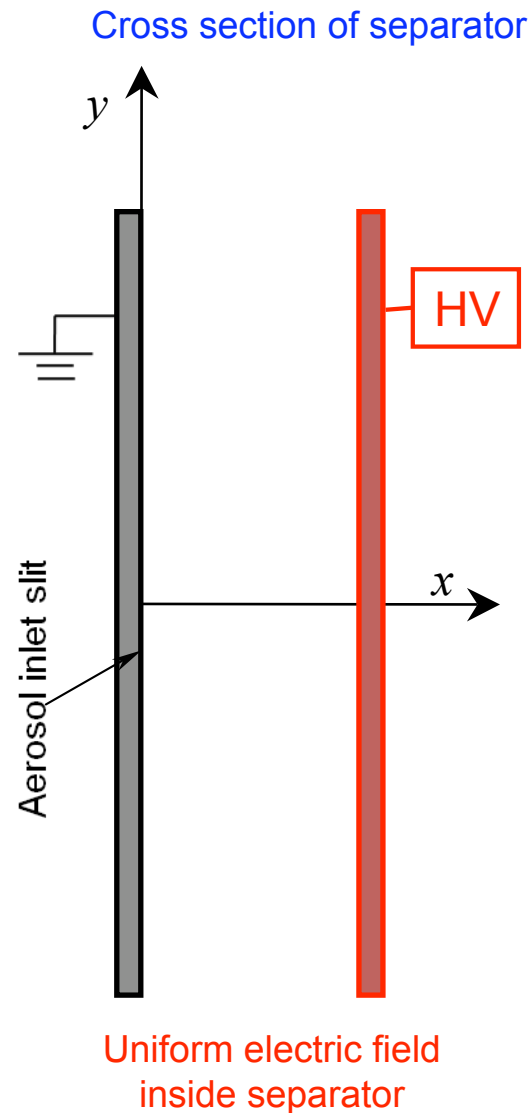
Fast FIMS measurements onboard aircraft

Measurement onboard Gulfstream-1 near Oklahoma City on June 15, 2007

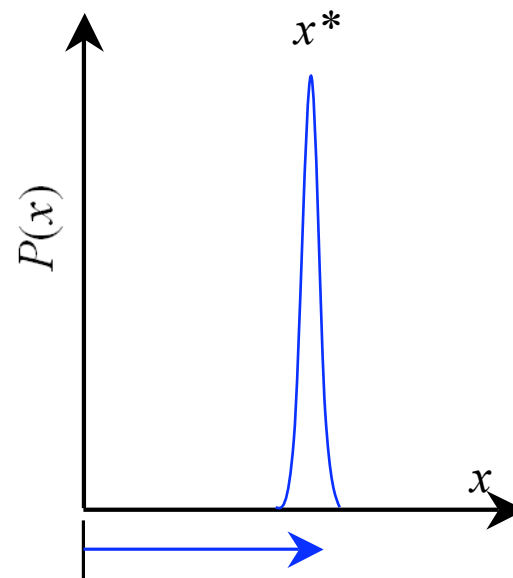


Many detailed variations were missed by the slow SMPS

Dynamic size range of FIMS using uniform electric field



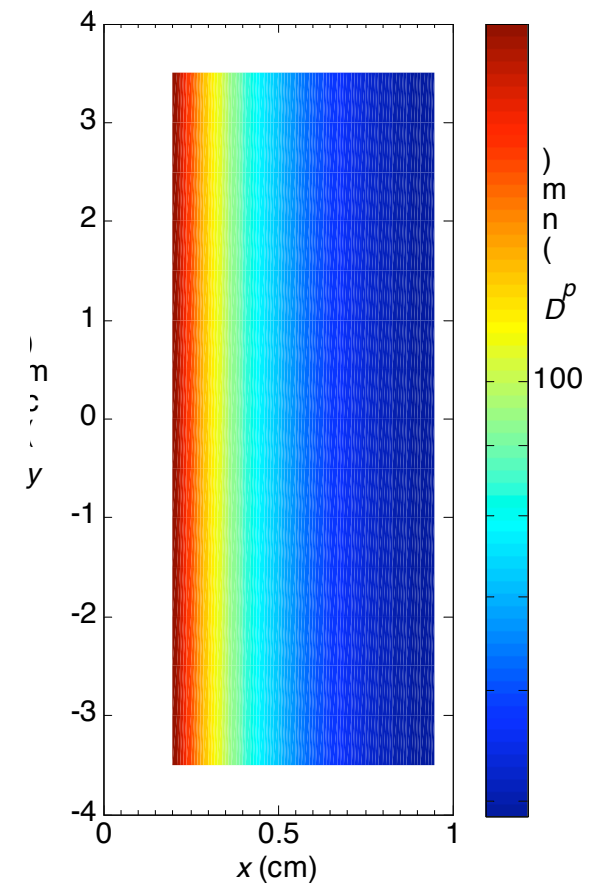
Distribution of x position of mono-dispersed aerosols



Reasons for the spread in distribution:

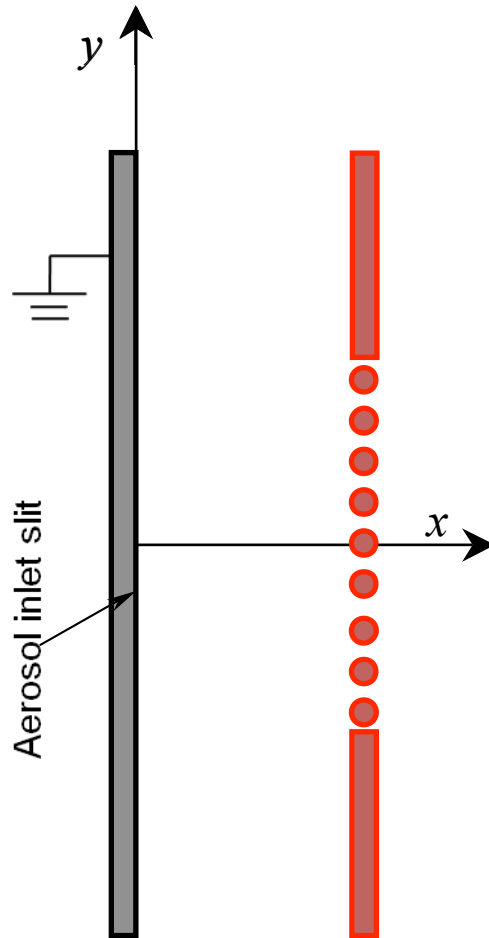
- Particles are introduced along different flow streamlines.
- Particle Brownian diffusion.

Example of particle position at the exit of separator

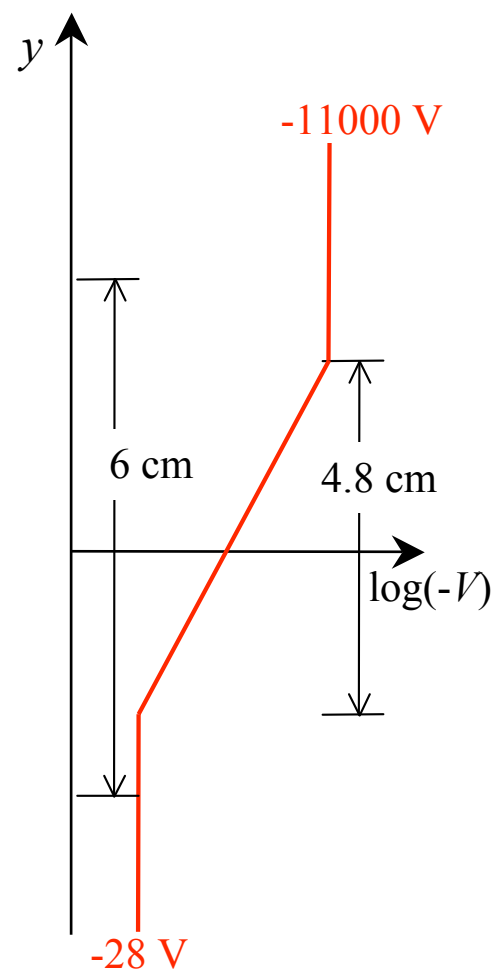


Electric field inside separator with new electrodes

Cross section of Separator

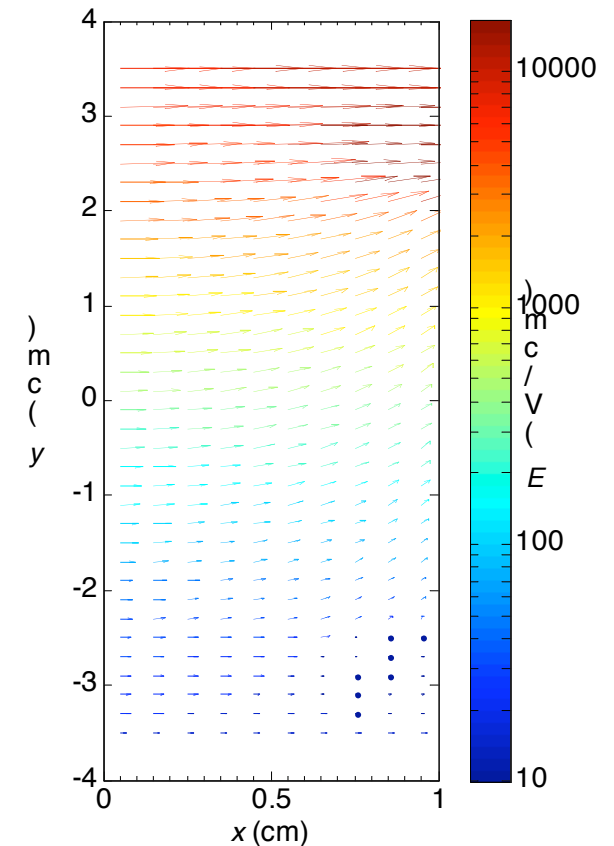


Voltage applied to HV electrode



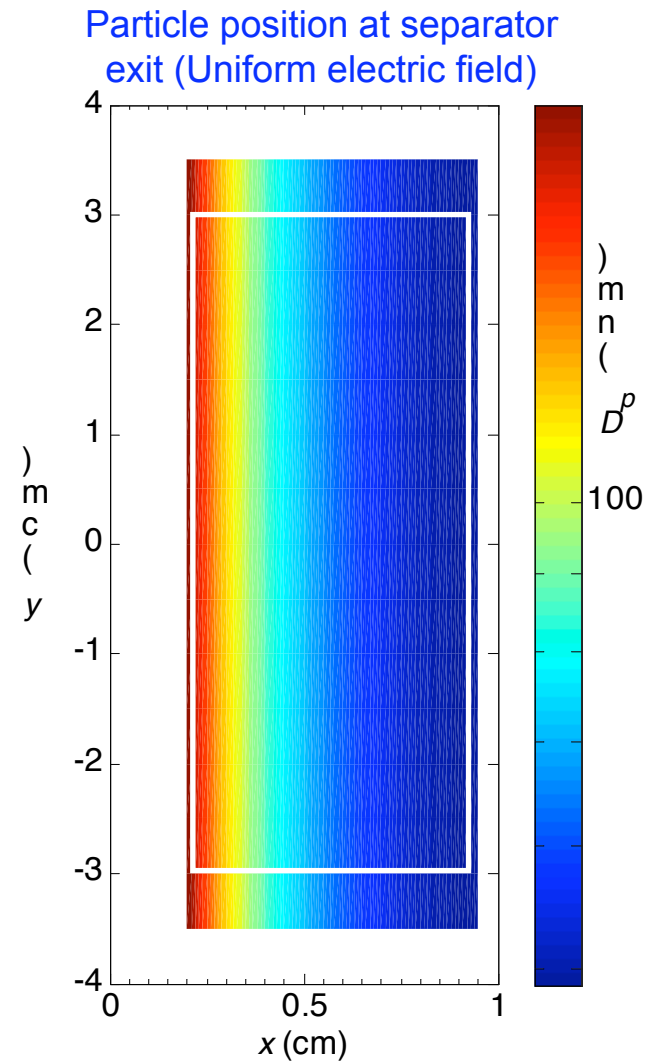
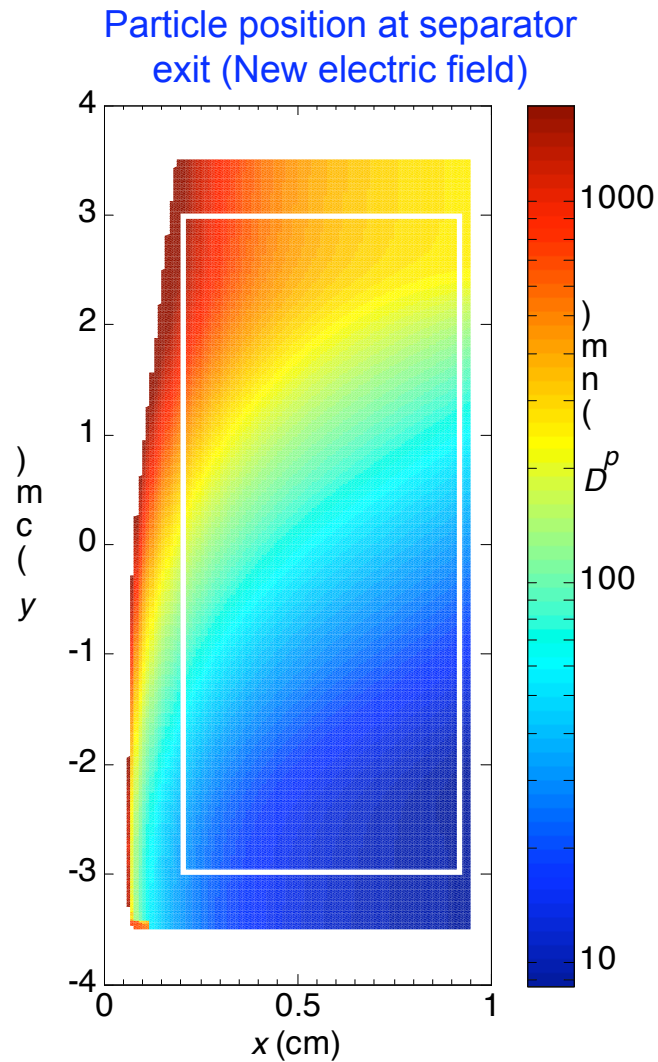
Applied voltage varies exponentially with y at the center of the electrode.

Electric field inside separator

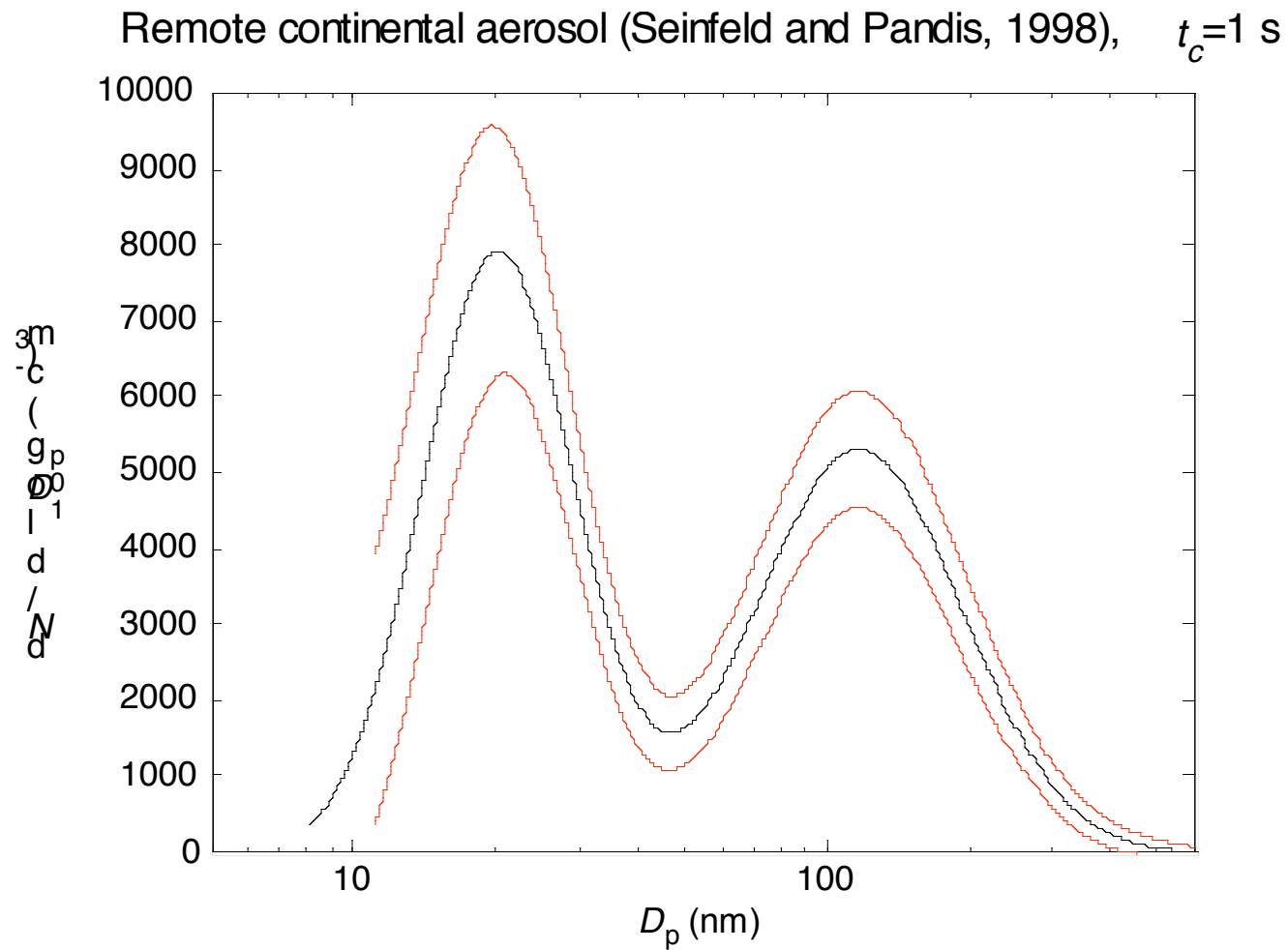


Regions with different electric field strengths (vary over three orders of magnitude)

Enhanced dynamic size range with the new design



Counting statistics of the new FIMS



Summary

The new FIMS will measure aerosol size distribution from 10 to 1000 nm in 1 s or less.

Questions?